CLAIMS

1. Implantable electromechanical converter for receiving oscillations from an ear ossicle and for converting the received oscillations into an electrical voltage, for use as a microphone for a cochlea implant or an implantable hearing aid, comprising piezoelectric converter elements (11) housed in a hermetically sealed hollow body (2) made of a biocompatible material, **characterized in** that the hollow body has a thin shell (9) which is connected with its interior side to the piezoelectric converter elements and which can be coupled with its exterior side to an ear ossicle, and which is held by a stable edge (10), whereby the stable edge can be coupled to a counter-support in the middle ear space.

2. Converter according to claim 1, characterized in that the stable edge (10) is shaped as an elliptical hollow cylinder.

3. Converter according to claim 1 or 2, characterized in that the hollow body (8) includes a means for limiting the excursion of the thin shell.

4. Converter according to one of claims 1 to 3, characterized in that the biocompatible material of the hollow body (8) is titanium or a titanium alloy.

5. Converter according to one of claims 1 to 4, characterized in that the thin shell (9) is formed as a plate with a thickness of between 20 and 50 µm.

6. Converter according to one of claims 1 to 5, characterized in that the connection between the thin shell (9) and the stable edge (10) is welded.

7. Converter according to one of claims 1 to 5, characterized in that the thin shell (9) and the stable edge (10) are formed as a single piece and the shape is achieved by a mechanical separation or forming process or an etching process.

8. Converter according to one of claims 1 to 7, characterized in that the piezoelectric converter elements (11) are made of piezoelectric ceramic materials, piezoelectric films, or piezoelectric single crystal, preferably lead zinc niobate-lead titanate (PZN-PT) or lead magnesium niobate-lead titanate (PMN-PT).

9. Converter according to one of claims 1 to 8, characterized in that the piezoelectric converter elements (11) connected with the thin shell (9) by an adhesive.

10. Converter according to one of claims 1 to 8, characterized in that the piezoelectric converter elements (11) are mechanically supported in contact with the thin shell (9).

11. Converter according to one of claims 1 to 10, characterized in that the piezoelectric converter elements (11) are implemented as unimorphic or multimorphic bending plates or bending beams.

12. Converter according to one of claims 1 to 11, characterized in that the electronic circuit (27) located inside the hollow body (8) is provided for conditioning the electrical voltage tapped at the piezoelectric converter elements (11).

13. Converter according to one of claims 1 to 12, characterized in that hermetically sealed, electrically insulating feedthroughs (15) extending through the stable edge (10) are provided for externally tapping the optionally electronically conditioned electrical voltage present at the piezoelectric converter elements (11).

14. Converter according to claim 13, characterized in that the electrically insulating feedthroughs (15) are made of glass, ceramics and minerals.

15. Converter according to one of claims 1 to 14, characterized in that the thin shell (9) is coupled to the articular cartilage (7) of the severed incus–stapes joint (5) that is coupled with the long incus appendage.

16. Converter according to one of claims 1 to 15, characterized in that the counter-support is formed of a post (21) made of a biocompatible material, which can be supported on one end in a recess of the oval window (6) and is formed on the other end to receive the stable edge (10).

17. Converter according to claim 16, characterized in that the post (21) includes a means for anchoring in a bone canal of the stapes tendon.

18. Converter according to claims 16 or 17, characterized in that the post (21) includes a means for positioning the thin shell (9) relative to the ear ossicle to be coupled.

19. Converter according to claim 18, characterized in that the positioning means are implemented as insertable support plates or wedges made of a biocompatible material which are inserted between the post (21) and the stable edge (10).

20. Converter according to claim 18, characterized in that the positioning means are implemented as two segments of the post (21) wherein both segments can be lockably connected with each other.

21. Converter according to one of claims 1 to 15, characterized in that the counter-support is formed by a support element (19) that is connected with one end with the stable edge and can be connected by screws with the bone on the other end.